

### Claims

1. Gear transmission comprising a first shaft (45),  
an intermediate shaft (44) which is parallel to  
the first shaft, a first cylindrical pinion (6)  
5 which can rotate with the first shaft, a second  
cylindrical pinion (6) which can rotate with the  
intermediate shaft, the sets of toothing of the  
first cylindrical pinion and the second  
10 cylindrical pinion having the same number of teeth  
and the same diameter and meshing with one  
another, a third cylindrical pinion (5) which can  
rotate with the first shaft, a fourth cylindrical  
pinion (5) which can rotate with the intermediate  
15 shaft, the sets of toothing of the third  
cylindrical pinion and the fourth cylindrical  
pinion having the same number of teeth and the  
same diameter, a double-toothed face gear (38)  
mounted between and <sup>RESPECTIVELY</sup> meshing with the sets of  
20 toothing of the third cylindrical pinion and the  
fourth cylindrical pinion, the double-toothed face  
gear being able to rotate about a second shaft  
which forms an angle with the first shaft, wherein  
the double-toothed face gear (38) is provided with  
a coupling toothing (39) for slideably coupling  
25 the rotation of the double-toothed face gear (38)  
to the rotation of the second shaft, and the  
direction of the coupling toothing is  
perpendicular to the plane of the sets of toothing  
of the double-toothed face gear.  
30
2. The gear transmission as claimed in claim 1,  
wherein the double-toothed face gear is designed  
as a large ring with the face-gear toothing on  
either side and the coupling toothing on the  
35 internal diameter.
3. The gear transmission as claimed in claim 2,  
wherein the internal diameter of the sets of face-  
gear toothing of the double-toothed face gear more

or less corresponds to the internal diameter of the large ring.

4. The gear transmission as claimed in claim 1, 2 or  
5 3, wherein the length of the coupling toothing is  
greater than half the width of the sets of  
toothing of the double-toothed face gear.
5. The gear transmission as claimed in one of the  
10 preceding claims, characterized in that the sets  
of toothing of the double-toothed face gear match  
one another, and the tooth spaces and teeth are  
symmetrical with respect to a plane which lies  
centrally between the sets of toothing.
- 15 6. The gear transmission as claimed in one of claims  
2-5, wherein the large ring has a thickness of at  
least four times the tooth height of one of the  
sets of toothing of the double-toothed face gear.
- 20 7. The gear transmission as claimed in one of the  
preceding claims, wherein the third and fourth  
cylindrical pinions (5) and the double-toothed  
face gear (38) are helically toothed, and the  
25 third and fourth pinions are both right-hand or  
left-hand pinions.
8. The gear transmission as claimed in one of the  
preceding claims, wherein the cylindrical pinions  
30 (5, 6) are helically toothed, and the first and  
second cylindrical pinions *have the same direction*  
*as* ~~are right hand pinions~~  
~~the third and fourth cylindrical pinions when~~  
mounted on the same shaft, ~~are also right-hand~~  
~~pinions, and are left-hand pinions if the third~~  
35 ~~and fourth cylindrical pinions are also left hand~~  
~~pinions.~~
9. The gear transmission as claimed in claim 8,  
wherein the pitch of cylindrical pinions mounted

on the same shaft is identical.

10. The gear transmission as claimed in one of the preceding claims, characterized in that the  
5 double-toothed face gear (38) is mounted slideably on the housing of a differential of a vehicle.